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(54) Gas fire.

(57) A porous gas fire element the surface of which carries or is formed into simulated solid fuel, wherein the main heating effect is by combustion of a gas/air mixture passed through and burning at the surface of the element but a secondary gas supply is arranged to pass through the pores of the element itself and burn in the form of discrete flames alongside the simulated fuel, simulating its combustion and giving a subsidiary heating effect.

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GAS FIRE

The invention relates to gas fires.

In a continuing effort to provide a gas fire simulating a solid fuel fire realistically we have considered in particular the flame effect of burning solid fuel. Fires in which gas burns with luminous flames between loose simulated fuel in the form of coal or logs are known, but their gas consumption is not satisfactory nor do they give the feeling of radiant heat necessary to successful simulation. In other fires, where the gas is efficiently used premixed with air and burns at the surface of a ceramic body, the heating effect is excellent but no flame effect is given and separate means such as those of U.K. Patent Specification No. 2 068 106 have to be provided (it has loose simulated fuel elements supported above a radiant with gas piped to them).

We have sought a simulated solid fuel fire in which the main heating effect is by surface combustion of a gas/air mixture passed through a porous element or plaque but which also has a flame effect. We have found that such a fire can be effectively and simply provided if a secondary gas supply is arranged to pass through the pores of the plaque itself and burn in the form of discrete flames alongside the fuel, simulating its combustion and giving a subsidiary heating effect which, optionally, may be independent of the main heating.

The plaque is suitably of ceramic foam of the kind disclosed in published PCT Specification No. GB83/00282 (WO 84/01992), or other material showing cross-porosity allowing some air to be entrained into the secondary gas stream.

A section of a fire on the above principle is shown in the accompanying drawing where within a metal casing 10 a lower body or box of conventional alumina-silica ceramic 9 defines a gas-air plenum 1 fed with gas from a jet 8a through an air entrainment venturi 4 in known manner. The jet has a 1.92mm diameter orifice and operates at 17.5cm (water gauge) pressure using natural gas, the venturi being 12cm long with a 15mm throat and 20mm entry. A ceramic foam plaque 2 45cm across is shaped at the surface to represent artificial solid fuel 7 and closes the top of the box. It is of 30 pore per 25mm grade and is sealed into the metal casing and to the secondary gas supply points with glass fibre tape and a conventional sodium silicate cement, as indicated at 11, 12 respectively. Representative separate gas feeds 8b 5mm diameter are shown centrally, fed from a gas plenum 1a and pipe 8c and controlled by needle valve gas rate control chokes 3.

In use of the fire the solid fuel 7, coloured and rendered substantially impermeable by sprayed-on clay/water slip coloured with black and coral underglaze pottery colours and optionally glazed in known manner, forms non-glowing areas between which at 5 are glowing areas simulating the bed of a solid fuel

fire. In one or more, preferably in at least several, of these areas luminous gas flames 6 play. No special apertures through the plaque are used, and the construction gives sufficient air for combustion in a luminous flame but without sooting. Desirably the gas feeds are behind or rather below the fuel, which may be formed in one piece with the plaque as shown or if desired as separate members placed on a suitably shaped plaque.

In a fire as above the appearance over known fires is improved in the following ways:-

a) Luminous secondary flames may easily be provided at any desired point on the plaque without any gas feeds being visible.

b) The plaque may be adjusted to maintain a bright glow whilst also producing luminous flames.

c) The luminous flames and the glow may be separately controlled.

d) The plaque in the area of each luminous flame will continue to glow but at a lower intensity when the luminous flames only are in operation.

e) Random movements of the luminous flames are matched in the glowing plaque giving a flickering fire effect.

f) A very wide full on to minimum gas rate ratio may be used.

g) When set on a very low (turn down) gas rate, the effect of burning solid fuel is still maintained.

h) As some air is drawn into the gas stream passing through the plaque, the luminous flames are partly aerated and therefore any propensity to soot is largely removed.

i) Due to the slight aeration of the secondary flames, and the still partly glowing plaque surface, the combustion of the fuel gas is more complete, increasing the production of CO_2 and reducing CO.

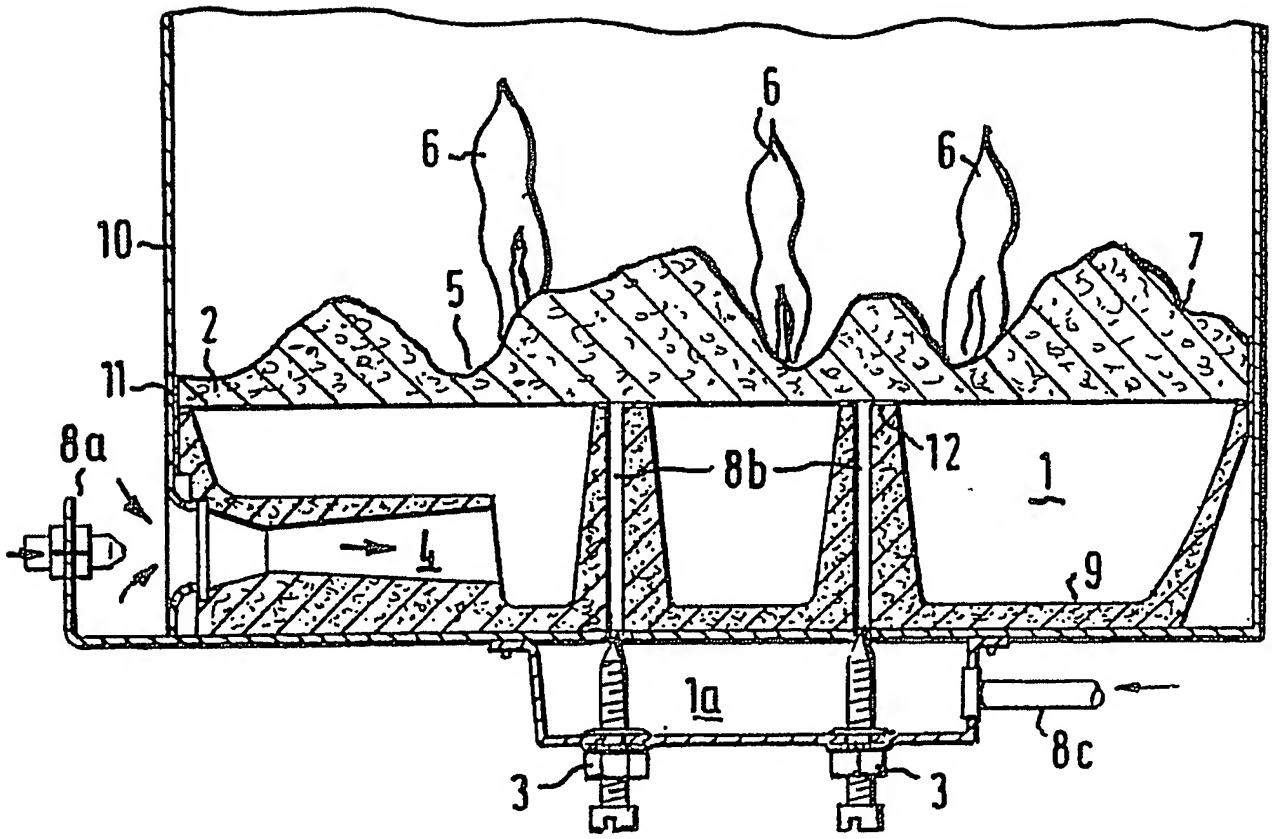
j) The improvement in combustion efficiency enables the overall appliance thermal efficiency to be improved.

k) The slight aeration of the secondary flames and glowing base improves heat transfer to imitation fuel pieces placed upon the plaque and causes these to maintain a glow when the appliance is set to a low gas rate.

CLAIMS

1. A porous gas fire element the surface of which carries or is formed into simulated solid fuel, wherein the main heating effect is by combustion of a gas/air mixture passed through and burning at the surface of the element but a secondary gas supply is arranged to pass through the pores of the element itself and burn i the form of discrete flames alongside the simulated fuel, simulating its combustion and giving a subsidiary heating effect.

2. A gas fire according to claim 1, wherein the plaque is of ceramic foam or other material showing cross-porosity allowing some air to be entrained into the secondary gas supply.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